

REMARKS

The Office action of December 6, 2005, has been carefully considered.

Claims 1 through 14, 18-19, 21-26, 28-32 and 37-40 have been rejected under 35 U.S.C. 102(b) as anticipated by Clingman et al, while Claim 27 has been rejected under 35 U.S.C. 103(a) as obvious over Clingman et al.

The invention is directed to die coating for a metal mold or a die component, as well as to a process for providing the coating and to the metal mold or die itself. The coating is formed by co-deposition using thermal spraying of a powder of a ceramic material and a powder of organic polymer material, followed by heating the co-deposited layer to remove the polymer material and provide a porous layer of ceramic material having a thickness of about 250 to 400  $\mu\text{m}$ . Claims 26-28 have now been amended to recite this thickness range.

Clingman et al is directed to an abradable ceramic seal coating on at least one of a pair of members having relative rotational movement. The coating is typically formed of stabilized zirconia which is co-deposited using a flame spray technique with a polyester powder. After the layer is deposited onto a substrate, the substrate is heated to a temperature of about 1800°F (982°C) for an appropriate period of time to remove the polyester powder, and leave a porous ceramic coating of stabilized zirconia. The purpose of this coating is to wear away during rubbing contact with another member.

In the previous response, Applicants argued that the abradable porous layer of Clingman et al had a thickness in the range of 0.040 to 0.060 inches, which is machined to a useful thickness of 0.18 to 0.02 inches (col 3, lines 30-36). This useful thickness corresponds to 457-508  $\mu\text{m}$ , as compared

with the presently claimed coating thickness of about 250 to 400  $\mu\text{m}$ . It was noted that the benefit of the thinner coating layer of the invention is that a lower temperature is required to completely decompose all of the polymer. For example, a temperature of no more than  $450^{\circ}\text{C}$  is necessary according to the invention to decompose the polymer, whereas a temperature of at least  $982^{\circ}\text{C}$  ( $1800^{\circ}\text{F}$ ) is required according to Clingman et al.

The final Office Action responds:

"However, examiner did not use this range. Examiner is referring to porous layer 3' (col. 3, line 28), where the range is 0.014-0.016 inches, which corresponds to 355-406 microns."

In this regard, the final Office Action has assumed that layer 3' is porous. There is no basis for this assumption. Clingman et al only states:

"A layer 3' of yttria stabilized zirconia is then applied to a thickness of from about 0.014-0.016 inches using equipment and parameters as disclosed in U.S. Pat. No. 4,055,705. The abradable yttria stabilized zirconia final layer 7 is then deposited to a thickness of about 0.040-0.060 inches by techniques which produce the desired density reduction."

A copy of US 4,055,705 is attached hereto for reference. This patent discloses depositing a highly reflective ceramic coating which may be  $\text{ZrO}_2\text{-Y}_2\text{O}_3$ . See col. 2, lines 16-20. The coating method uses a bond coating of NiCrAlY (as does Clingman et al); no mention is made of the ceramic coating layer being porous, and the ceramic coating layer is not co-deposited with a polymer, as is done according to the claimed invention to obtain a porous layer.

Moreover, as the layer deposited in the '055 patent is

highly reflective, one can assume that it is not porous, as porous surfaces tend to absorb and trap, rather than reflect, light.

There is thus no evidence that layer 3' of Clingman et al is porous, and much evidence that it is not, given the disclosure that the layer is prepared according to US 4055705, which produces a highly reflective layer.

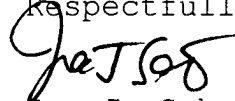
As the Clingman et al reference does not disclose or suggest a porous layer of ceramic material having a thickness of about 250 to 400  $\mu\text{m}$ , Applicants submit that the rejected claims are patentable thereover, and withdrawal of these rejections is requested.

The allowance of claims 33-36 has been noted. Claim 37 has now been amended to correct an error in the previous amendment, in which claim 37 depended from claim 30 rather than claim 36. Since claims 37-39 now depend directly or ultimately from allowable claim 36, Applicants submit that claims 37-39 are also allowable.

Claim 40 is directed to a mold or metal die component coated at least in part by a coating according to allowed claim 33. No reason is seen why claim 40 should not also be allowed over the prior art as a claim which depends from an allowed claim.

In view of the foregoing amendments and remarks, Applicants submit that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

Respectfully submitted,



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